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Report

OF THE

Botanical Survey of India

FOR

1950-51.

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ANNUAL REPORT OF THE BOTANICAL SURVEY OF INDIA FOR THE YEAR 1950-51.

Staff : Shri R. Seshagiri Rao, appointed as Systematic Assistant took charge of duties from the 19th., July, 1950, from which date Shri V. Narayanaswami retired. The work of this officer and the staff of the Systematic Section of the Botanical Survey of India and various other interests of the Govt. of India at the Herbarium of the Indian Botanic Garden, Calcutta, were supervised as usual by the writer.

Botanical Tours : A preliminary botanical exploration was undertaken by the writer upto Jalap La, one of the latest Passes to Tibet at an elevation of about 14,000 to 15,000 ft. on the border of the Eastern Sikkim and Tibet—the main trade route from India to Tibet, during the month of May. Another trip was made in the Duars of the Darjeeling district in the month of October. About 4000 specimens were brought to the Herbarium from these two trips in the East Himalayas. Many Alprine and Sub-Alpine plants collected from the Sikkim and Tibet borders are being acclimatised at the Llyod Botanic Garden, Darjeeling.

Research Workers and Visitors : A good number of Research workers from various departments such as the Jute Agricultural Research Institute, Hooghly ; the Geological Survey of India ; State Agricultural Farm, Chinsura ; Pharmacognosy Laboratory, Calcutta ; Botany Department, Calcutta Univeristy ; Presidency College, Calcutta ; Dacca University ; Delhi University and Government College, Darjeeling worked in the Herbarium for different periods.

Among the noted scientists from abroad who visited the Herbarium may be mentioned, Dr. Joseph Rock, Emeritus Professor, Arnold Arboretum, U.S.A. ; Dr. Morten Lange, Kobenhaus University, Denmark ; Prof. Dounine of Timirijashef Agricultural Academy, Moscow accompanied by the members of the Locust Research Delegation ; Dr. A. Muntzing of Lund University, Sweden ; Prof. R. E. Holtum of the University of Malaya, Singapore ; Prof. & Mrs. A. D. Ross, University of Western Australia ; Prof. J. Millot, Director, Botanic Garden, Madagascar ; Dr. W. Y. Chun of Sunyatsen University, Canton, China with other Chinese Delegates and many other famous foreign and Indian scientists.

Herbarium work : 4337 specimens were identified with the help of the Herbarium staff during the year. Of these 2017 were received from different institutions and Colleges such as Presidency College, Calcutta ;

P. R. College, Kakinada ; Bhagalpore College ; Rangoon University ; Rice Research Institute, Cuttack ; Damodar Valley Corporation, Hazaribagh ; Forest Research Institute, Dehra Dun and others.

(*ii*) 353 specimens were received from National Museum, Manila ; West Virginia University ; University of Toronto and Forest Research Institute, Dehra Dun. 377 duplicates were distributed to the Arnold Arboretum, U. S. A. ; the University of Toronto, Canada and the Forest Research Institute, Dehra Dun. Specimens of *Memecylon* species, stems and roots of *Phoenix paludosa* Roxb., roots of 12 species of palms, flower buds of *Microcos* and *Grewia* were supplied to various Indian workers for their investigation. Herbarium sheets of *Dilleniaceae* and of genera like *Pittosporum*, *Mimusops* and a few others were sent on loan to research workers in India and abroad for floristic study.

(*iii*) 36732 sheets reaching upto a part of the family Sapindaceae were stamped and numbered. 2556 specimens were mounted, 5514 sheets were repaired, 572 sheets were incorporated and 36 genus covers and 2009 species covers were replaced by new ones with the necessary nomenclatural changes.

Research work : The Systematic Assistant continued his work on the Indo-Malayan species of Viscum.

Supply of information : This section continued to supply necessary information to various industrialists, research workers and others in India and abroad. It thus served as a Bureau of information and advice on the vegetable resources of the country, in conformity with its past tradition.

Notes on nomenclature and distribution of Indian species of *Strophanthus*, *Stephania*, *Ephedra*, *Diospyros*, *Balanophora* and many other plants ; literature and other details on Indian desert plants, Indian trees and flowers; Indian fodder plants, including grasses, legumes and trees and on *Dombeya*, *Vitex*, *Xanthophyllum*, *Dioscorea*, *Hexagona*, *Pyrethrun*, *Hevia* and other genera; places of availability of the Indian and foreign medicinal plants ; *Aponogeton* and *Echinochorus* species have duly been supplied to various correspondents in India and countries overseas.

Information in Agrimony, on the occurence of *Argyreia speciosa* Sw. in India and its efficacy in the treatment of Carbuncle, on the importance of *Indigofera tinctoria* and other details of "*Krisha chura*" and raw *Cautchouc*, on the medicinal plants available in the Nilgiris and about the suitable altitudes, places of cultivation and other details of *Pyrethrum*, *Artemisia*, *Lobelia* and several essential oil yielding plants like *Cymbopogon*, *Amomum*, *Rhododendron*, and others have also been supplied. Studies on medicinal plants such as *Stephania*, *Strophanthus*, *Vitex*, *Pyrethrum*, *Artemisia*, *Aconitum*, Belladona,

Hyoscyamus, Ipecacuanha and others received particular attention in connection with the supply of necessary information on the cultivation of the medicinal plants under the auspices of the Medicinal plants Committee of the Govt. of West Bengal of which the Superintendent is one of the Joint Secretaries and the Hon'ble Dr. B. C. Roy, the Chief Minister of the Govt. of West Bengal is the Chairman.

Publications:—(1) "India's natural resources with special reference to the vegetable wealth of the Sikkim Himalaya"—in the Annual number of the 'Manufacturer', May 1950; (2) "Possibilities of Perfumery Industry in West Bengal", in the Puja number of the Manufacturer; (3) "Tree Planting in India"—in the "March of India" October, 1950; (4) "Balance of Life in Nature" in the Puja Number of Hindusthan Standard; (5) "Introduction of Cow Tree in India"—Science and Culture, Vol. 16, November 1950 (6) "Van Mahotsaver Katha"—A pamphlet in Bengali; (7) "Pharmacognosy in India"—Presidential address in the Proceedings of the Third Session of the Indian Pharmaceutical Congress ; (8) "Sargassa of Indian Seas"—(Dr. K. Biswas and Shri A. K. Sharma)—in Journal Roy. As. Soc. Bengal Science, Vol. 16, No. 1, 1950 are the articles contributed by the Superintendent during the year.

The text volume of "Bharitya Banaushadhi" a monumental work in Bengali on Indian Medicinal Plants is now being published in three volumes with the plates bound together.

A popular lecture on "plant Life in Water" illustrated with lantern slides was delivered by the Superintendent on the 18th January, 1951 under the auspices of the Royal Asiatic Society of Bengal.

There is a regular demand for the various volumes of Duthie's Flora of the Upper Gangetic Plain and the Records of the Botanical Survey of India, even pre-1937 publications. Many copies were sold out, realising a total revenue of Rs. 349/4/-. The distribution of most of the copies, as many as 402 of the Annual Report for the year 1948-49 was also completed during the year.

Scientific contribution relating to Indian Botany :

Nearly 40 papers were published during the year by various workers in India and abroad in different branches of the Indian Botany, such as Taxonomy, Morphology, Embryology, Cytology, Ecology, Palaeontology, Algology, Phytopathology and Economic Botany.

Sd/- K. Biswas,
Superintendent,
Indian Botanic Garden, Calcutta

SUMMARY

Botanical explorations were carried out upto Jalap La border of Tibet and East Sikkim along the Kalimpong—Lahsa Trade route to Tibet upto an elevation of about 14,000-15,000 ft. The Duars of the Darjeeling district along the border of Bhutan and Bengal were also visited with a view to studying the local flora and the climatic and edaphic conditions for the cultivation of medicinal plants and extension of Ipecac lines in this area below cinchona belt. More than 4000 botanical specimens were brought to the Herbarium along with the necessary useful plants for acclimatisation in the Lloyd Botanic Garden, Darjeeling and Indian Botanic Garden, Calcutta.

This section continued to serve as a Bureau of the Information and supplied much information and advice on botanical and other allied matters to many correspondents. Valuable information on important medicinal plants such as *Stephania*, *Strophanthus*, *Vitex*, *Pyrethrum*, *Artemisia*, *Aconitum*, Belladona, *Hyoscyamus*, Ipecacuanha and others were supplied to the Central Medicinal Plants Committee and also newly formed Medicinal Plants Committee set up by the Govt. of West Bengal, with the Hon'ble Dr. B. C. Roy as the Chairman and the Superintendent as one of the Joint Secretaries.

Over 4000 specimens have been indentified and many specimens from other herbaria were distributed to leading botanical institutions in India and abroad on exchange basis. The routine work of stamping and numbering, mounting, repairing and incorporating of herbarium sheets continued as usual.

There was much demand for "Duthie's Flora of Upper Gangetic Plains" and different numbers of the Records of the Botanical Survey of India which were duly sold out. Some valuable papers were published and some are under preparation.

Sd/- K. Biswas,
Superintendent,
Indian Botanic Garden, Calcutta.

INDUSTRIAL SECTION, INDIAN MUSEUM, CALCUTTA.

REPORT FOR THE YEAR 1950-51.

PUBLIC GALLERY : A fine collection of 266 colour pictures of Economic plants at a cost of Rs. 1,330/- formed by far the most important acquisition made during the year under review.

One large sized picture of an edible fungus (*Morchella esculenta*) and 11 colour pictures, illustrating Sugar-cane industry, were also prepared and displayed in the public gallery. 20 photographs of economic trees were also exhibited. An attractive model of a cocoanut tree is also added to the gallery.

The restoration of the galleries demanded practically the whole time of the staff and apart from the usual pressure of work, extra effort was needed for maintaining the galleries, labelling and explaining the exhibits to the visitors. Over 25,508 exhibits were treated and redisplayed in the gallery. 3,431 labels were changed and 859 fresh labels were printed for the various exhibits. Bengali and Hindi labels were also introduced to a limited number of exhibits.

FIXTURES :—200 picture frames for the plant portraits were purchased at a total cost of Rs. 1,150/-.

ACCESSIONS :—Besides the colour portraits of economic plants, over 670 specimens were acquired for the gallery, indicating about 26% increase over the previous year.

The collections of photographs to illustrate various industries such as Vanaspati and Vegetables Ghee Industry, Mysore Sandal wood Oil Industry, Hand-made Paper Industry, Soap, Coir, Jute and Cotton Industries was also quite satisfactory. Over 70 photographs taken during tours were also added on to our general collections.

FIELD EXPLORATIONS AND SCIENTFIC INVESTIGATIONS :—Three tours were undertaken by the Curator during the year, viz. (i) to Chilka Lake (15-4-1950—23-4-50) (ii) to Nepal (23-10-50—7-11-50) and (iii) to Okhamandal and Bombay Coast (25-1-1951—23-2-1951). The expenses involved in respect of the first two tours were met from the departmental budget while the travelling expenses amounting to about Rs. 1,700/- on account of the third tour were met by the Trustees of the Indian Museum.

Field studies were made on the spot and a very rich and seasonal collection from all the areas covered were brought to the Museum for record, exhibition and further investigations. The collections from these areas included several species of beautiful terrestrial and epiphytic orchids medicinal and other economic plants, marine and brackish water algae, planktonic diatoms, marine epiphytic flora, liverworts, mosses and ferns. Both herbarium and fluid preparations were made of the specimens collected as far as possible.

The preliminary investigations of the collections revealed several new records for these localities and their further study is in progress. Some of the interesting finds are illustrated in the accompanying plate (Pl. 1, figs. 1, 2, 3 & 4).

As in previous years, this institution co-operated with other research departments in scientific pursuits. Authentic samples of stem, bark and roots of *Berberis asiatica* were procured from Kashmir and sent to Dr. R. Chatterjee of the Presidency College, Calcutta for chemical investigation and study. The Director, Pharmacognosy Laboratory, Government of India, was also supplied with 5 kg. of *Daemia extensa* for research purposes.

EXPERIMENTAL TRIALS ON ECONOMIC PLANTS :—Some experimental trials on the germination of seeds of the following three economic plants procured from abroad were conducted, viz. (1) Cork-oak tree (*Quercus suber*) ; (2) Chinchweed (*Pectis papposa*) ; (3) Milk tree (*Brosimum galactodendron*).

1. **Cork-oak tree** : This is a well-known economic plant for the cork which it yields and which product is of great value in industry. Seeds of this plant were obtained from Spain and Paris and those from the latter locality were distributed to some parties in India. The results of these experiments are awaited.

2. **Chinchweed** : The Chinchweed is a heavily-scented herb, native to North America, containing an essential oil, rich in cumaldehyde and carvone. The results obtained by the Director of Agriculture, Madras, who collaborated with us in conducting certain preliminary investigations, indicated that the germination rate was upto only 30%. Further trials are contemplated on the plant.

3. **Milk tree** : This tree is a native of Tropical America, and is known to flourish also in the sub-tropical rain forests in Venezuela and elsewhere (Pl , II, fig. 1). It is reported to yield copious latex (Pl. II, fig. 2) which closely resembles Cow's milk and is said to be used by the natives for food, being considered both agreeable and wholesome.

Records show that several attempts were made in many places to grow the Milk tree, but without any success. One of the seeds that was sown in the Indian Museum Compound on 12-10-1949 germinated after a lapse of nearly 8 months. After another 4 months a tiny seedling was established and by the end of December, 1950, it had grown to a beautiful seedling nearly 9″ high, above the ground level, bearing 4 or 5 healthy leaves (Pl, II, fig.-3). Unfortunately by the last week of May 1951; the plant suddenly withered away and died, possibly because of the severe summer conditions that prevailed then.

The results obtained in this connection by the Government Botanical Gardens, Lalbagh, Bangalore, Govt. of Mysore, are also encouraging. By April, 1951, the plant which had come up from one of the seeds sent by us, bore 5 leaves and had obtained a height of nearly 9″. The plant is reported by them to be quite vigorous and healthy in growth. Further progress of this surviving member, will be watched with great interest.

EDUCATIONAL SERVICES AND POPULAR LECTURES :—Special demonstration lectures were arranged by the Curator as in previous years At the invitation of the Botanical Society of Bengal, the writer delivered a lecture on the inter-tidal vegetation of some South Indian coasts, and another at Charu Chandra College, on the occasion of their anniversary celebrations on some aspects of marine flora and their economic aspects. These lectures were highly appreciated. Usual facilities were also rendered to students to study our collections in the Museum. At the request of the President of the Zoological Society of Bengal, the Industrial Section participated in an exhibition organised by them. On the occasion of the Annual General Meeting of the Botanical Society of Bengal, another exhibition was also arranged.

ENQUIRIES ATTENDED :—The Industrial Section continued to render valuable services in the dissemination of knowledge on economic plants. The enquiries attended to inculded among numerous others, the source of supply of various crude drugs such as *Ipecacuanha*, *Strychnos nux-vomica*, *Cinchona* etc., cultivation of medical plants, source of supply of economic timbers in commercial quantities, essential oil-yielding plants of Bengal, various information on *Hyoscyamus niger*, *Divi divi*, *Pyrethrum*, *Borassus*, *Sago palm*, *Cow tree*, *Chaulmoogra*, *Ergot*, *Derris*, *Albizzia lebbek*, *Croton tiglium*, etc., fodder for cattle and elephants, Agar-agar yielding species of sea-weeds recorded from Indian coasts, scientific and vernacular terms of trees, and also the indentification and characters of trees mentioned in Sanskrit literature. The beneficiaries were correspondents both from India and abroad.

SUPPLY OF PLANT MATERIALS AND EXCHANGE RELATIONS ESTABLISHED WITH FOREIGN INSTITUTIONS :—Requests for the supply of authentic materials of a number of medicinal, ornamental and other economic plants have been frequent from parties both in India and abroad for research and other purposes.

IDENTIFICATION OF SPECIMENS :—Identification of specimens was carried out as usual for a number of scientific workers, commercial firms and other private bodies.

LIBRARY : Fair progress was made in the classification of books, indexing and catalouging. 985 publications were added ; 213 books were loaned out, 6208 publications were reaccesioned and 1866 index cards were prepared. Physical verification of the books in the liberary was also undertaken. Necessary facilities were rendered to research workers to consult the library. The manuscript for the printing of a catalogue is in progress.

HERBARIUM : The work in the herbarium attached to the Industrial Section could not be projected to our target level due to lack of adequate funds for field work and lack of assistants especially of the nature of plant collectors. Nevertheless the progress made was satisfactory. Nearly 1750 herbarium sheets were prepared from freshly made phanerogamic and cryptogamic collections, which indicate nearly 93% increase over the previous year. 3499 herbarium sheets were treated with preservatives, 2043 herbarium sheets were repaired and 252 genus covers were renewed. Identification and labelling of specimens in this herbarium were also carried on as usual.

VISITORS : The total number of visitors for the year under review was 7,12,530. Quite a large number of students made free use of the Museum as an educational centre. Among the distinguished visitors may be mentioned—foreign delegates who visited India in connection with the Centenary Celebrations of the Geological Survey of India and the Annual Session of the Indian Science Congress ; Dr. Hsu Hsi Ling of UNESCO, Research Fellow in Education, Prof. T. Millot, Director of Research and Scientific Studies, Madagascar and Mr. A Deinnitzug, Sweeden.

FINANCE : The total budget grant during the year 1950-51 under Demand No. 40 Botanical Survey of India was Rs. 78,000/- out of which a sum of Rs. 39,400/- was spent upto September 1950. A sum of Rs. 30,300/- only was sanctioned for the Industrial Section for the remaining period of six months.

The Trustees of the Indian Museum placed at the writer's disposal a sum of Rs. 4,700/- towards restoration and other work connected with the Gallery. The entire amount was spent during the year.

STAFF AND ADMINISTRATION : The post of the Director, Botanical Survey of India, being not filled up, his duties were also discharged by the Curator in so far as this section was concerned. The undersigned served also as an ex-officio Trustee in the Board of Trustees, Indian Museum and its Honorary Secretary throughout the year.

All the members of the staff of this office worked satisfactorily.

Sd/- K. S. Srinivasan,
10-9-51,
Curator,
Industrial Section, Indian Museum.

EXPLANATION OF PLATES I & II

PLATE I.

Fig. 1. *Pseudobryopsis mueronata Boergs* a typical member of intertidal community- Dwarka : a new record for the area.

Fig. 2. *Hormophysa triquetra* L. Kutz a rare brown weed and a new record for Okha.

Fig. 3. *Rosenvingea intricata* (J. Ag.) Boergs a new record of a pheophyceae from Chilka Lake

Fig. 4. *Corynemorpha prismatica* J. Ag. a rare rock-pool community alga ; a new record for Okha.

PLATE II.

Fig. 1*—"Cow-tree"—in its natural habitat, Venezuela.

Fig. 2*—Close-up of a trunk of Cow-tree, tapped for the milk reported to be nutritious.

Fig. 3 —Seedling of Cow-tree, raised in the Indian Museum, from viable seeds procured from Venezuela.

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*The writer is indebted to Tobias Lasser, Caracas, Venezuela for the supply of 2 photographs, from which the above (figs. 1 & 2) are reproduced.

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SOME NEW RECORDS FOR CHILKA & OKHA.

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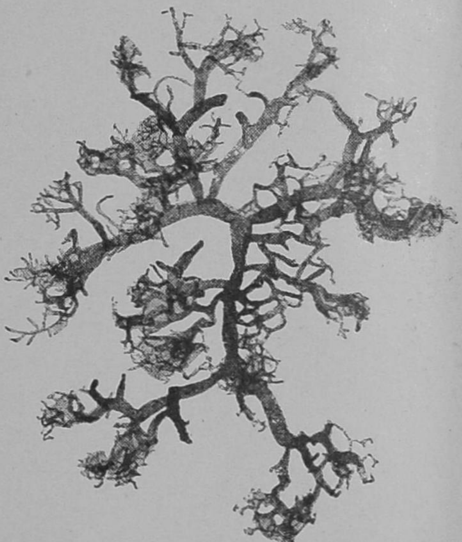

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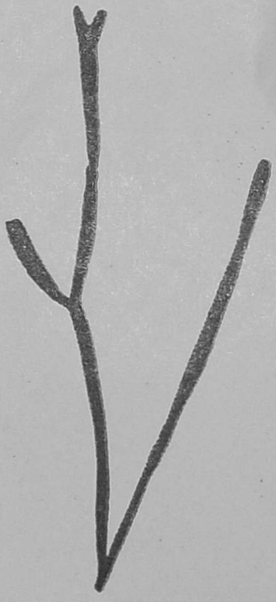

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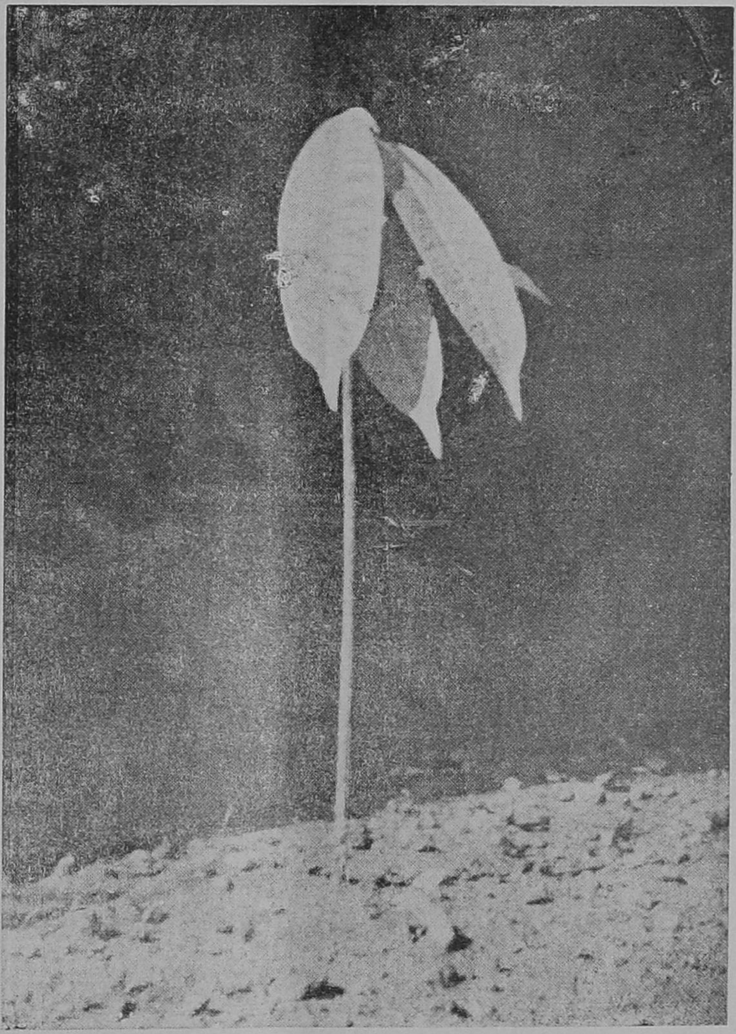

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